Pearson mathology

Correlation of Ontario Program of Studies with Mathology Grade 4

Overall Expectation
A1. Social-Emotional Learning (SEL) Skills and the Mathematical Processes

Mathology provides teachers with a flexible framework for Social Emotional Learning Skills, by including:
   o **Diverse resources** in real-world contexts, so students can see themselves and others while positively engaging in mathematical activities
   o **Differentiated support** to cope with challenges, meet students where they are and move them forward
   o **Learning opportunities** (small group, pair, whole class), to work collaboratively on math problems, share thinking, and listen to the thinking of others
   o **Digital** (e.g., virtual tools) and **printable resources** (e.g., lesson slides, line masters, and math mats), which allow students to reveal their mathematical thinking in a risk-free environment
   o **A variety of voices** (built by and for Canadian learners) and opportunities to support **local contexts (**modifiable resources)

Curriculum Expectations	Grade 4 Mathology.ca	Pearson Canada Grades 4-6 Mathematics Learning Progression
B. Number		
B1. Number Sense demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life		
Whole Numbers		
B1.1 read, represent, compose, and decompose whole numbers up to and including 10 000, using appropriate tools and strategies, and describe various ways they are used in everyday life	**Number Unit 1: Number Relationships and Place Value** 1: Representing Numbers to 10 000 2: Composing and Decomposing Larger Numbers 6: Consolidation of Number Relationships and Place Value	**Big Idea: Numbers are related in many ways. Decomposing and composing numbers to investigate equivalencies** - Composes and decomposes whole numbers using standard and non-standard partitioning (e.g., 1000 is 10 hundreds or 100 tens). **Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.** **Unitizing quantities into base-ten units**

	Number Unit 2: Fluency with Addition and Subtraction 7: Estimating Sums and Differences	- Writes and reads whole numbers in multiple forms (e.g., 1358; one thousand three hundred fifty-eight; 1000 + 300 + 50 + 8). - Understands that the value of a digit is ten times the value of the same digit one place to the right.
B1.2 compare and order whole numbers up to and including 10 000, in various contexts.	**Number Unit 1: Number Relationships and Place Value** 4: Comparing and Ordering Numbers 6. Consolidation of Number Relationships and Place Value	**Big Idea: Numbers are related in many ways. Comparing and ordering quantities (multitude or magnitude)** - Compares, orders, and locates whole numbers based on place-value understanding and records using <, =, > symbols.
B1.3 round whole numbers to the nearest ten, hundred, or thousand, in various contexts	**Number Unit 1: Number Relationships and Place Value** 3: Estimating and Rounding Numbers 5: Estimating to Solve Problems 6: Consolidation of Number Relationships and Place Value **Number Unit 2: Fluency with Addition and Subtraction** 7: Estimating Sums and Differences	**Big Idea: The set of real numbers is infinite. Estimating quantities and numbers** - Rounds whole numbers using place-value understanding (e.g., 4736 can be rounded to 5000, 4700, 4740).
Fractions and Decimals		
B1.4 represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meaning of the denominator and the numerator	**Number Unit 3: Fractions** 13: What Are Fractions? 15: Exploring Different Representations of Fractions 19: Consolidation of Fractions	**Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.** **Partitioning quantities to form fractions** - Partitions fractional parts into smaller fractional parts (e.g., partitions halves into thirds to create sixths).
B1.5 use drawings and models to represent, compare, and order fractions representing the individual portions that result from two different fair-share	**Number Unit 3: Fractions** 16: Sharing Equally	**Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.**

scenarios involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers	17: Exploring Equivalence in Fractions 18: Comparing and Ordering Fractions 19: Consolidation of Fractions	**Partitioning quantities to form fractions** - Partitions fractional parts into smaller fractional parts (e.g., partitions halves into thirds to create sixths). **Big Idea: Numbers are related in many ways.** **Comparing and ordering quantities (multitude or magnitude)** - Compares, orders, and locates fractions with the same numerator or denominator using reasoning (e.g., $\frac{3}{5} > \frac{3}{6}$ because fifths are larger parts). - Compares, orders, and locates fractions using flexible strategies (e.g., comparing models, creating common denominators or numerators). **Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units** **Partitioning quantities to form fractions** - Partitions fractional parts into smaller fractional parts (e.g., partitions halves into thirds to create sixths). - Explains that two equivalent fractions represent the same part of a whole, but not necessarily equal quantities (e.g., $\frac{1}{2}$ of a set of 12 and $\frac{1}{2}$ of a set of 6 are equal fractions, but unequal quantities). - Continues to extend fraction understanding to multiple contexts (e.g., sharing, division, ratios).
B1.6 count to 10 by halves, thirds, fourths, sixths, eighths, and tenths, with and without the use of tools	**Number Unit 3: Fractions** 14: Counting by Unit Fractions 19: Consolidation of Fractions	**Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.** **Partitioning quantities to form fractions** - Uses models to describe, name, and count forward and backward by unit fractions.
B1.7 read, represent, and order decimal tenths, in various contexts	**Number Unit 4: Decimals** 20: Exploring Tenths	**Big Idea: The set of real numbers is infinite.**

	22: Comparing and Ordering Decimals 23: Consolidation of Decimals	**Extending whole number understanding to the set of real numbers** - Explores decimal fractions to tenths (e.g., 0.1, 0.5, 0.8) and hundredths (e.g., 0.42, 0.05, 0.90). **Big Idea: Numbers are related in many ways.** **Comparing and ordering quantities (multitude or magnitude)** - Compares, orders, and locates decimal numbers using place-value understanding. **Estimating quantities and numbers** - Estimates the location of decimals and fractions on a number line. **Decomposing and composing numbers to investigate equivalencies** - Composes and decomposes decimal numbers using standard and non-standard partitioning (e.g., 1.6 is 16 tenths or 0.16 tens). **Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.** **Unitizing quantities into base-ten units** - Uses fractions with denominators of 10 to develop decimal fraction understanding and notation (e.g., five-tenths is $\frac{5}{10}$ or 0.5). - Counts forward and backward by decimal units (e.g., 0.1, 0.2, … 0.9, 1.0). - Understands that the value of a digit is ten times the value of the same digit one place to the right. - Understands that the value of a digit is one-tenth the value of the same digit one place to the left. - Writes and reads decimal numbers in multiple forms (e.g., numerals, number names, expanded form).
B1.8 round decimal numbers to the nearest whole number, in various contexts	**Number Unit 4: Decimals** 20: Exploring Tenths 23: Consolidation of Decimals	**Big Idea: Numbers are related in many ways** **Estimating quantities and numbers** - Provides approximate decimal values using

		multiple strategies (e.g., estimation, rounding, truncating).
B1.9 describe relationships and show equivalences among fractions and decimal tenths, in various contexts	**Number Unit 4: Decimals** 20: Exploring Tenths 23: Consolidation of Decimals	**Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.** **Unitizing quantities into base-ten units** - Uses fractions with denominators of 10 to develop decimal fraction understanding and notation (e.g., five-tenths is $\frac{5}{10}$ or 0.5). - Understands that the value of a digit is ten times the value of the same digit one place to the right. - Understands that the value of a digit is one-tenth the value of the same digit one place to the left.
B2. Operations		
use knowledge of numbers and operations to solve mathematical problems encountered in everyday life		
Properties and Relationships		
B2.1 use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers, including those requiring more than one operation, and check calculations	**Number Unit 2: Fluency with Addition and Subtraction** 9: Adding and Subtracting Larger Numbers 10: Using Mental Math to Add and Subtract 11: Creating and Solving Problems 12: Consolidation of Fluency with Addition and Subtraction **Number Unit 5: Fluency with Multiplication and Division Facts** 24: Strategies for Multiplication 25: Solving Multiplication Problems 26: Relating Multiplication	**Big Idea: Numbers are related in many ways.** **Estimating quantities and numbers** - Rounds whole numbers using place-value understanding (e.g., 4736 can be rounded to 5000, 4700, 4740). **Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Investigating number and arithmetic properties** - Recognizes and generates equivalent numerical expressions using commutative and associative properties. - Understands operational relationships (e.g., inverse relationship between multiplication/division, addition/subtraction). - Understands the identity of operations (e.g., 5 + 0 = 5; 7 × 1 = 7). **Developing conceptual meaning of operations** - Models and develops meaning for whole number computation to four digits.

	and Division 27: Strategies for Division 29: Consolidation of Fluency with Multiplication and Division **Number Unit 6: Multiplying and Dividing Larger Numbers** 30: Exploring Strategies for Multiplying 31: Estimating Products 32: Exploring Strategies for Dividing 33: Estimating Quotients 34: Dividing with Remainders 35. Consolidation of Multiplying and Dividing Larger Numbers	**Developing fluency of operations** - Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?). - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase).
Math Facts		
B2.2 recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts	**Number Unit 5: Fluency with Multiplication and Division Facts** 24: Strategies for Multiplication 25: Solving Multiplication Problems 26: Relating Multiplication and Division 27: Strategies for Division 29: Consolidation of Fluency with Multiplication and Division	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing fluency of operations** - Fluently recalls multiplication and division facts to 100.
Mental Math		
B2.3 use mental math strategies to multiply whole numbers by 10, 100, and 1000, divide whole numbers by 10, and	**Number Unit 6: Multiplying and Dividing Larger Numbers**	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.**

add and subtract decimal tenths, and explain the strategies used	30: Exploring Strategies for Multiplying 32: Exploring Strategies for Dividing 35: Consolidation of Multiplying and Dividing Larger Numbers **Number Unit 7: Operations with Fractions and Decimals** 37: Adding and Subtracting Decimals 38: Using Mental Math to Add and Subtract Decimals 40: Consolidation of Operations with Fractions and Decimals	**Developing conceptual meaning of operations** - Understands the effect of multiplying and dividing whole numbers by powers of 10. **Developing fluency of operations** - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase). - Solves decimal number computation using efficient strategies.
Addition and Subtraction		
B2.4 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms	**Number Unit 2: Fluency with Addition and Subtraction** 7: Estimating Sums and Differences 8: Modelling Addition and Subtraction 9: Adding and Subtracting Larger Numbers 10: Using Mental Math to Add and Subtract 11: Creating and Solving Problems 12: Consolidation of Fluency with Addition and Subtraction **Number Unit 7: Operations with Fractions and Decimals**	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Investigating number and arithmetic properties** - Recognizes and generates equivalent numerical expressions using commutative and associative properties. - Understands operation relationships (e.g., inverse relationship between multiplication/division, addition/subtraction). - Understands the identity of operations (e.g., 5 + 0 = 5; 7 × 1 = 7). **Developing conceptual meaning of operations** - Models and develops meaning for whole number computation to four digits. - Demonstrates an understanding of decimal number computation through modelling and flexible strategies.

	36: Estimating Sums and Differences with Decimals 37: Adding and Subtracting Decimals 38: Using Mental Math to Add and Subtract Decimals 40: Consolidation of Operations with Fractions and Decimals **Number Unit 8: Financial Literacy** 41: Purchasing and Making Change (Whole-Dollar Amounts) 43: Making Financial Decisions 45: Consolidation of Financial Literacy	**Developing fluency of operations** - Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?). - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase). - Estimates sums and differences of decimal numbers (e.g., calculating cost of transactions involving dollars and cents). - Solves decimal number computation using efficient strategies.
Multiplication and Division		
B2.5 represent and solve problems involving the multiplication of two- or three-digit whole numbers by one-digit whole numbers and by 10, 100, and 1000, using appropriate tools, including arrays	**Number Unit 6: Multiplying and Dividing Larger Numbers** 30: Exploring Strategies for Multiplying 31: Estimating Products 35: Consolidation of Multiplying and Dividing Larger Numbers	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing conceptual meaning of operations** - Models and develops meaning for whole number computation to four digits. - Understands the effect of multiplying and dividing whole numbers by powers of 10. **Developing fluency of operations** - Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?). - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and

		change owing, saving money to make a purchase).
B2.6 represent and solve problems involving the division of two- or three-digit whole numbers by one-digit whole numbers, expressing any remainder as a fraction when appropriate, using appropriate tools, including arrays	**Number Unit 6: Multiplying and Dividing Larger Numbers** 32: Exploring Strategies for Dividing 33: Estimating Quotients 34: Dividing with Remainders 35: Consolidation of Multiplying and Dividing Larger Numbers	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Partitioning quantities to form fractions** - Understands the fraction $\frac{a}{b}$ as $a \div b$. **Developing conceptual meaning of operations** - Models and develops meaning for whole number computation to four digits. - Understands the effect of multiplying and dividing whole numbers by powers of 10. - Models and develops meanings for division of whole numbers that result in fractions. **Developing fluency of operations** - Estimates the result of whole number operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?). - Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase).
B2.7 represent the relationship between the repeated addition of a unit fraction and the multiplication of that unit fraction by a whole number, using tools, drawings, and standard fractional notation	**Number Unit 7: Operations with Fractions and Decimals** 39: Repeated Addition with Unit Fractions 40: Consolidation of Operations with Fractions and Decimals	**Big Idea: Quantities and numbers can be grouped by or partitioned into equal-sized units.** **Partitioning quantities to form fractions** - Uses models to describe, name, and count forward and backward by unit fractions. - Understands the meaning of an $\frac{a}{b}$ fraction as a multiple of the unit fraction $\frac{1}{b}$ (e.g., $\frac{3}{5} = 3 \times \frac{1}{5}$).
B2.8 show simple multiplicative relationships involving whole-number rates, using various tools and drawings	**Number Unit 5: Fluency with Multiplication and Division Facts** 28: Whole Number Rates 29: Consolidation of Fluency	**Big Idea: Numbers are related in many ways.** **Using ratios, rates, proportions, and percents creates a relationship between quantities** - Demonstrates multiplicative reasoning by applying unit rates in whole number contexts (e.g., If she earns $12 per hour, how much will

	with Multiplication and Division	she earn for 5 hours of work?). - Understands the concept of ratio as a relationship between two quantities (e.g., 3 wins to 2 losses). - Understands and applies the concept of unit rates (e.g., If 3 kg is $5, how much is 1 kg or how many kg for $1?).

C. Algebra		
C.1 Patterns and Relationships		
identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts		
Patterns		
C1.1 identify and describe repeating and growing patterns, including patterns found in real-life contexts	**Patterning Unit 1: Patterns and Relations** 1: Repeating and Growing Patterns 6: Consolidation of Patterns and Relations	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing patterns, relations, and functions** - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. **Generalizing and analyzing patterns, relations, and functions** - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, … Start at 16 and add 6 each time). - Describes numeric and shape patterns using words and numbers.
C1.2 create and translate repeating and growing patterns using various representations, including tables of values and graphs	**Patterning Unit 1: Patterns and Relations** 1: Repeating and Growing Patterns 3: Representing Patterns 6: Consolidation of Patterns and Relations	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing patterns, relations, and functions** - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. - Uses multiple approaches to model situations involving repetition (i.e., repeating patterns) and change (i.e., increasing/decreasing patterns) (e.g., using objects, tables, graphs, symbols, loops and nested loops in coding). **Generalizing and analyzing patterns, relations, and functions** - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, … Start at 16 and add 6 each time).

		- Describes numeric and shape patterns using words and numbers.
C1.3 determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns	**Patterning Unit 1: Patterns and Relations** 1: Repeating and Growing Patterns 6: Consolidation of Patterns and Relations	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing patterns, relations, and functions** - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. **Generalizing and analyzing patterns, relations, and functions** - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, … Start at 16 and add 6 each time). - Describes numeric and shape patterns using words and numbers.
C1.4 create and describe patterns to illustrate relationships among whole numbers and decimal tenths	**Patterning Unit 1: Patterns and Relations** 4: Investigating Number Relationships 6: Consolidation of Patterns and Relations	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing patterns, relations, and functions** - Describes, generates, extends, translates, and corrects number and shape patterns that follow a predetermined rule. **Generalizing and analyzing patterns, relations, and functions** - Explains the rule for numeric patterns including the starting point and change (e.g., given: 16, 22, 28, 34, … Start at 16 and add 6 each time). - Describes numeric and shape patterns using words and numbers.

C.2 Equations and Inequalities demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts		
Variables		
C2.1 identify and use symbols as variables in expressions and equations	**Patterning Unit 2: Variables and Equations** 7: Using Symbols 8: Solving Equations Concretely 9: Solving Addition and Subtraction Equations 11: Solving Multiplication and Division Equations 12: Using Equations to Solve Problems 13. Consolidation of Variables and Equations	**Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.** **Understanding equality and inequality, building on generalized properties of numbers and operations** - Expresses a one-step mathematical problem as an equation using a symbol or letter to represent an unknown number (e.g., Sena had some tokens and used four. She has seven left: $\Box - 4 = 7$). **Using variables, algebraic expressions, and equations to represent mathematical relations** - Understands an unknown quantity (i.e., variable) may be represented by a symbol or letter (e.g., $13 - \Box = 8$; $4n = 12$). - Flexibly uses symbols and letters to represent unknown quantities in equations (e.g., knows that $4 + \Box = 7$; $4 + x = 7$; and $4 + y = 7$ all represent the same equation with $\Box$, x, and y representing the same value). - Interprets and writes algebraic expressions (e.g., $2n$ means two times a number; subtracting a number from 7 can be written as $7 - n$). - Understands a variable as a changing quantity (e.g., $5s$, where s can be any value).

Equalities and Inequalities

C2.2 solve equations that involve whole numbers up to 50 in various contexts, and verify solutions	**Patterning Unit 2: Variables and Equations** 8: Solving Equations Concretely 9: Solving Addition and Subtraction Equations 11: Solving Multiplication and Division Equations 12: Using Equations to Solve Problems 13. Consolidation of Variables and Equations	**Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.** **Understanding equality and inequality, building on generalized properties of numbers and operations** - Determines an unknown number in simple one-step equations using different strategies (e.g., $n \times 3 = 12$; $13 - \square = 8$). - Uses arithmetic properties to investigate and transform one-step addition and multiplication equations (e.g., $5 + 4 = 9$ and $5 + a = 9$ have the same structure and can be rearranged in similar ways to maintain equality: $4 + 5 = 9$ and $a + 5 = 9$). - Uses arithmetic properties to investigate and transform one-step subtraction and division equations (e.g., $12 - 5 = 7$ and $12 - b = 7$ have the same structure and can be rearranged in similar ways to maintain equality: $12 - 7 = 5$ and $12 - 7 = b$).
C2.3 solve inequalities that involve addition and subtraction of whole numbers up to 20, and verify and graph the solutions	**Patterning Unit 2: Variables and Equations** 10: Solving Addition and Subtraction Inequalities 13. Consolidation of Variables and Equations	

C3. Coding

solve problems and create computational representations of mathematical situations using coding concepts and skills

Coding Skills

C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events	**Patterning Unit 3: Coding** 14: Writing Code 15: Making Shapes 16: Coding a Shape Design 17. Consolidation of Coding	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing patterns, relations, and functions.** -Uses multiple approaches to model situations involving repetition (i.e., repeating patterns) and change (i.e., increasing/decreasing patterns) (e.g., using objects, tables, graphs, symbols, loops and nested loops in coding).

Pearson

		Big Idea: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes. **Investigating geometric attributes and properties of 2-D shapes and 3-D solids** - Sorts, describes, constructs, and classifies polygons based on side attributes (e.g., parallel, perpendicular, regular/irregular). - Understands angle as a geometric figure formed from two rays or line segments sharing a common endpoint. **Big Idea: Objects can be located in space and viewed from multiple perspectives.** **Locating and mapping objects in space** - Extends understanding of locating, describing, and relating the movement of objects on grids and maps.
C3.2 read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes	**Patterning Unit 3: Coding** 15: Making Shapes 16: Coding a Shape Design 17. Consolidation of Coding	**Big Idea: Regularity and repetition form patterns that can be generalized and predicted mathematically.** **Representing patterns, relations, and functions.** -Uses multiple approaches to model situations involving repetition (i.e., repeating patterns) and change (i.e., increasing/decreasing patterns) (e.g., using objects, tables, graphs, symbols, loops and nested loops in coding). **Big Idea: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes.** **Investigating geometric attributes and properties of 2-D shapes and 3-D solids** - Sorts, describes, constructs, and classifies polygons based on side attributes (e.g., parallel, perpendicular, regular/irregular). - Understands angle as a geometric figure formed from two rays or line segments sharing a common endpoint. **Big Idea: Objects can be located in space and viewed from multiple perspectives.** **Locating and mapping objects in space**

		- Extends understanding of locating, describing, and relating the movement of objects on grids and maps.
C4. Mathematical Modeling		
Apply the process of mathematical modelling to represent, analyse, make predictions, and provide insight into real-life situations		
This overall expectation has no specific expectations. Mathematical modelling is an iterative and interconnected process that is applied to various contexts, allowing students to bring in learning from other strands. Students' demonstration of the process of mathematical modelling, as they apply concepts and skills learned in other strands, is assessed and evaluated.	**Number** 5: Estimating to Solve Problems 11: Creating and Solving Problems 16: Sharing Equally 22: Comparing and Ordering Decimals 27: Strategies for Division 30: Exploring Strategies for Multiplying 34: Dividing with Remainders 36: Estimating Sums and Differences with Decimals 41: Purchasing and Making Change (Whole-Dollar Amounts) **Patterning** 3: Representing Patterns 12: Using Equations to Solve Problems 14: Writing Code **Measurement**	

	6: Exploring the Area of Rectangles 9: Investigating Capacity 16: Exploring Elapsed Time **Geometry** 2: Properties of Rectangles 5: Investigating Translations **Data Management** 5: Analyzing Data 8: Making and Testing Predictions	

D. Data

D1. Data Literacy

manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

Data Collection and Organization

D1.1 describe the difference between qualitative and quantitative data, and describe situations where each would be used	**Data Management Unit 1B: Data Management** 1: Qualitative and Quantitative Data 2: Collecting and Organizing Data 7. Consolidation of Data Management	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Collecting data and organizing it into categories** - Distinguishes between categorical (e.g., pet type, occupation) and discrete (e.g., class size, free throws made) data.
D1.2 collect data from primary and secondary sources to answer questions of interest that involve comparing two or more sets of data, and organize the data in frequency tables and stem-and-leaf plots	**Data Management Unit 1B: Data Management** 1: Qualitative and Quantitative Data 2: Collecting and Organizing Data 3: Exploring Stem-and-Leaf Plots and Multiple-Bar Graphs 6: Creating Infographics 7. Consolidation of Data Management	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Collecting data and organizing it into categories** - Constructs data organizers to support data collection (e.g., creates tally chart or line plot on a grid to collect survey data).

		- Selects and justifies an appropriate method of data collection (e.g., experiment, observation, survey) based on question posed. **Creating graphical displays of collected data** - Creates charts and graphs with appropriate titles and labels to represent data collected (e.g., bar graph, line plot, pictograph, stem-and-leaf plot). - Visually represents two or more data sets (e.g., double bar chart, stacked bar graph, multi-line graph, multi-column table).
Data Visualization		
D1.3 select from among a variety of graphs, including multiple-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graph	**Data Management Unit 1B: Data Management** 3: Exploring Stem-and-Leaf Plots and Multiple-Bar Graphs 5: Analyzing Data 7. Consolidation of Data Management	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Creating graphical displays of collected data** - Creates charts and graphs with appropriate titles and labels to represent data collected (e.g., bar graph, line plot, pictograph, stem-and-leaf plot). - Represents data graphically using many-to-one correspondence with appropriate scales and intervals (e.g., each symbol on pictograph represents 10 people). - Visually represents two or more data sets (e.g., double bar chart, stacked bar graph, multi-line graph, multi-column table).
D1.4 create an infographic about a data set, representing the data in appropriate ways, including in frequency tables, stem-and-leaf plots, and multiple-bar graphs, and incorporating any other relevant information that helps to tell a story about the data	**Data Management Unit 1B: Data Management** 6: Creating Infographics 7. Consolidation of Data Management	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Creating graphical displays of collected data** - Creates charts and graphs with appropriate titles and labels to represent data collected (e.g., bar graph, line plot, pictograph, stem-and-leaf plot).

		- Represents data graphically using many-to-one correspondence with appropriate scales and intervals (e.g., each symbol on pictograph represents 10 people). - Chooses and justifies appropriate visual representations for displaying discrete (e.g., bar graph) and continuous (e.g., line graph) data. - Visually represents two or more data sets (e.g., double bar chart, stacked bar graph, multi-line graph, multi-column table).
Data Analysis		
D1.5 determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers, and explain what each of these measures indicates about the data	**Data Management Unit 1B: Data Management** 4: Determining Mean, Median, and Mode 5: Analyzing Data 6: Creating Infographics 7. Consolidation of Data Management	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Reading and interpreting data displays and analyzing variability** - Visualizes and determines the median value as a middle measure representing a whole data set. - Visualizes and determine the mean of a data set. - Understands that measures of central tendency (i.e., mode, median, mean) are summary measures that represent all values in a data set with a single number (i.e., most frequent value; middle value; balance point of values). **Using the language and tools of chance to describe and predict events** - Describes data using frequency counts (e.g., 5 people chose peppermint) and modal value (e.g., dogs are the most common pet).

Pearson

D1.6 analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions	**Data Management Unit 1B: Data Management** 3: Exploring Stem-and-Leaf Plots and Multiple-Bar Graphs 5: Analyzing Data 6: Creating Infographics 7. Consolidation of Data Management	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Drawing conclusions by making inferences and justifying decisions based on data collected** - Draws conclusions based on data presented. - Interprets the results of data presented graphically from primary (e.g., class survey) and secondary (e.g., online news report) sources.
D2. Probability		
describe the likelihood that events will happen, and use that information to make predictions		
Probability		
D2.1 use mathematical language, including the terms "impossible", "unlikely", "equally likely", "likely", and "certain", to describe the likelihood of events happening, represent this likelihood on a probability line, and use it to make predictions and informed decisions	**Data Management Unit 2: Probability** 8: Describing Likelihood of Events 9: Predicting Outcomes of an Event 12. Consolidation of Probability	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Using the language and tools of chance to describe and predict events** - Locates the likelihood of outcomes on a vocabulary-based probability continuum (e.g., impossible, unlikely, likely, certain). - Distinguishes between equally likely events (e.g., heads or tails on a fair coin) and unequally likely events (e.g., spinner with differently sized sections).
D2.2 make and test predictions about the likelihood that the mean, median, and mode(s) of a data set will be the same for data collected from different populations	**Data Management Unit 2: Probability** 8: Describing Likelihood of Events 9: Predicting Outcomes of an Event 10: Conducting Experiments to Check Predictions	**Big Idea: Formulating questions, collecting data, and consolidating data in visual and graphical displays help us understand, predict, and interpret situations that involve uncertainty, variability, and randomness. Collecting data and organizing it into categories** - Records the results of multiple trials of simple events.

	11: Making and Testing Predictions 12. Consolidation of Probability	**Using the language and tools of chance to describe and predict events** - Identifies the sample space of independent events in an experiment (e.g., flipping a cup, drawing a coloured cube from a bag).
E. Spatial Sense		
E1. Geometric and Spatial Reasoning describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them		
Geometric Reasoning		
E1.1 identify geometric properties of rectangles, including the number of right angles, parallel and perpendicular sides, and lines of symmetry	**Geometry Unit 1B: 2-D Shapes and Angles** 2: Properties of Rectangles 4. Consolidation of 2-D Shapes and Angles	**Big Idea: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes.** **Investigating geometric attributes and properties of 2-D shapes and 3-D solids** - Sorts, describes, constructs, and classifies polygons based on side attributes (e.g., parallel, perpendicular, regular/irregular). - Sorts, describes, and classifies 2-D shapes based on their geometric properties (e.g., side lengths, angles, diagonals). **Investigating 2-D shapes, 3- D solids, and their attributes through composition and decomposition** - Identifies types of lines in 2-D images (e.g., parallel, intersecting, perpendicular).
Location and Movement		
E1.2 plot and read coordinates in the first quadrant of a Cartesian plane, and describe the translations that move a point from one coordinate to another	**Geometry Unit 2: Grids and Transformations** 6: Plotting and Reading Coordinates 8. Consolidation of Grids and Transformations	**Big Idea: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change.** **Exploring 2-D shapes and 3-D solids by applying and visualizing transformations** - Identifies, describes, and performs single transformations (i.e., translation, reflection, rotation) on 2-D shapes. **Big Idea: Objects can be located in space and viewed from multiple perspectives.** **Locating and mapping objects in space**

		- Develops understanding of a Cartesian plane as a coordinate system using perpendicular axes. - Plots and locates points on a Cartesian plane, and relates the location to the two axes. (Limited to the first quadrant.)
E1.3 describe and perform translations and reflections on a grid, and predict the results of these transformations	**Geometry Unit 2: Grids and Transformations** 5: Investigating Translations 7: Investigating Reflections 8. Consolidation of Grids and Transformations	**Big Idea: 2-D shapes and 3-D solids can be transformed in many ways and analyzed for change.** **Exploring 2-D shapes and 3-D solids by applying and visualizing transformations** - Identifies, describes, and performs single transformations (i.e., translation, reflection, rotation) on 2-D shapes.
E2. Measurement		
compare, estimate, and determine measurements in various contexts		
The Metric System		
E2.1 explain the relationships between grams and kilograms as metric units of mass, and between litres and millilitres as metric units of capacity, and use benchmarks for these units to estimate mass and capacity	**Measurement Unit 2: Mass, Capacity** 8: Investigating Mass 9: Investigating Capacity 10: Exploring Metric Prefixes 11: Consolidation of Mass and Capacity	**Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.** **Understanding relationships among measured units** - Understands and applies the multiplicative relationships among metric units of length, mass, and capacity.
E2.2 use metric prefixes to describe the relative size of different metric units, and choose appropriate units and tools to measure length, mass, and capacity	**Measurement Unit 1: Length, Perimeter, and Area** 1: Estimating and Measuring in Millimetres 2: Measuring Length in Different Units 7: Consolidation of Length, Perimeter, and Area **Measurement Unit 2: Mass, Capacity** 8: Investigating Mass 9: Investigating Capacity	**Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.** **Selecting and using units to estimate, measure, construct, and make comparisons** - Chooses the most appropriate unit to measure a given attribute of an object (e.g., classroom area measured in square metres). **Understanding relationships among measured units** - Understands and applies the multiplicative relationships among metric units of length, mass, and capacity.

Pearson

	10: Exploring Metric Prefixes 11: Consolidation of Mass and Capacity	
Time		
E2.3 solve problems involving elapsed time by applying the relationships between different units of time	**Measurement Unit 3: Time** 14: Telling Time on a 24-Hour Clock 15: Relationships Between Units of Time 16: Exploring Elapsed Time 18. Consolidation of Time	**Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.** **Selecting and using units to estimate, measure, construct, and make comparisons** - Reads and records time (i.e., digital and analogue) and calendar dates. **Understanding relationships among measured units** - Understands relationships among different measures of time (e.g., seconds, minutes, hours, days, decades).
Angles		
E2.4 identify angles and classify them as right, straight, acute, or obtuse	**Geometry Unit 1B: 2-D Shapes and Angles** 1: Exploring Benchmark Angles 4. Consolidation of 2-D Shapes and Angles	**Big Idea: 2-D shapes and 3-D solids can be analyzed and classified in different ways by their attributes.** **Investigating geometric attributes and properties of 2-D shapes and 3-D solids** - Understands angle as a geometric figure formed from two rays or line segments sharing a common endpoint. - Draws, compares, and classifies angles (i.e., right, acute, obtuse, straight, reflex).
Area		
E2.5 use the row and column structure of an array to measure the areas of rectangles and to show that the area of any rectangle can be found by multiplying its side lengths	**Measurement Unit 1: Length, Perimeter, and Area** 4: Estimating and Measuring Area in Square Metres 5: Estimating and Measuring Area in Square Centimetres 6: Exploring the Area of Rectangles 7. Consolidation of Length, Perimeter, and Area	**Big Idea: Many things in our world (e.g., objects, spaces, events) have attributes that can be measured and compared.** **Understanding attributes that can be measured, compared, and ordered** - Understands area as an attribute of 2-D shapes that can be measured and compared. **Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.**

		Selecting and using units to estimate, measure, construct, and make comparisons - Develops understanding of square units (e.g., square unit, square cm, square m) to measure area of 2-D shapes. **Understanding relationships among measured units** - Develops and generalizes strategies to compute area and perimeter of rectangles.
E2.6 apply the formula for the area of a rectangle to find the unknown measurement when given two of the three	**Measurement Unit 1: Length, Perimeter, and Area** 6: Exploring the Area of Rectangles 7. Consolidation of Length, Perimeter, and Area	**Big Idea: Patterns and relations can be represented with symbols, equations, and expressions.** **Using variables, algebraic expressions, and equations to represent mathematical relations** - Uses expressions and equations with variables to represent generalized relations and algorithms (e.g., $P = 2l + 2w$). **Big Idea: Assigning a unit to a continuous attribute allows us to measure and make comparisons.** **Understanding relationships among measured units** - Develops and generalizes strategies to compute area and perimeter of rectangles.
Financial Literacy		
F1. Money and Finances demonstrate the knowledge and skills needed to make informed financial decisions		
Money Concepts		
F1.1 identify various methods of payment that can be used to purchase goods and services	**Number Unit 8: Financial Literacy** 43: Making Financial Decisions	
F1.2 estimate and calculate the cost of transactions involving multiple items priced in whole-dollar amounts, not including sales tax, and the amount of	**Number Unit 8: Financial Literacy** 41: Purchasing and Making Change (Whole-Dollar Amounts)	**Big Idea: Quantities and numbers can be operated on to determine how many and how much.** **Developing fluency of operations** - Estimates the result of whole number

change needed when payment is made in cash, using mental math	45: Consolidation of Financial Literacy	operations using contextually relevant strategies (e.g., How many buses are needed to take the Grade 8 classes to the museum?).
		- Solves whole number computation using efficient strategies (e.g., mental computation, algorithms, calculating cost of transactions and change owing, saving money to make a purchase).
		- Estimates sums and differences of decimal numbers (e.g., calculating cost of transactions involving dollars and cents).
		- Solves decimal number computation using efficient strategies.
Financial Management		
F1.3 explain the concepts of spending, saving, earning, investing, and donating, and identify key factors to consider when making basic decisions related to each	**Number Unit 8: Financial Literacy** 43: Making Financial Decisions 44: Making Good Purchases 45. Consolidation of Financial Literacy	
F1.4 explain the relationship between spending and saving, and describe how spending and saving behaviours may differ from one person to another	**Number Unit 8: Financial Literacy** 43: Making Financial Decisions 45. Consolidation of Financial Literacy	
Consumer and Civic Awareness		
F1.5 describe some ways of determining whether something is reasonably priced and therefore a good purchase	**Number Unit 8: Financial Literacy** 44: Making Good Purchases 45. Consolidation of Financial Literacy	